



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

RICHARD W. ARNOLD ET AL.

09/845 344

Serial No. 09/431,730 (TI-27698.1)

Filed May 1, 2001

For: STUD-CONE BUMP FOR PROBE TIPS
USED IN KNOWN GOOD DIE CARRIERS

Art Unit 2829

Examiner Asok. K. Sarkar

Customer No. 23494

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BRIEF ON APPEAL

REAL PARTY IN INTEREST

The real party in interest is Texas Instruments Incorporated, a Delaware corporation with offices at 7839 Churchill Way, Dallas, Texas 75251.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals and/or interferences.

STATUS OF CLAIMS

This is an appeal of claims 13 to 20, all of the rejected claims. No claims have been allowed and the parent application is now Patent No. 6,376,352. Please charge any costs to Deposit Account No. 20-0668.

STATUS OF AMENDMENTS

An amendment was not filed after final rejection.

SUMMARY OF INVENTION

The invention relates to a known good die (KGD) carrier membrane for use in conjunction with a semiconductor carrier in the testing of semiconductor devices. In accordance with the present invention, there is provided a bumping technology that meets the pitch requirements of the evolving semiconductor products and which can be placed upon a low cost membrane with electrically conductive traces thereon that mirror the test carrier requirements. This is provided by a membrane (9) for use in conjunction with a semiconductor carrier, the membrane being an electrically insulating substrate for application to a semiconductor carrier (1) having an interconnect pattern (17) on the substrate. A stud (15) is coupled to the interconnect pattern on the substrate, the stud comprising a gold ball (27) and a compliant material coating ((33) over a portion of the gold ball. The gold ball is preferably the ball of a ball bond. The coating is preferably a compliant epoxy resin, preferably filled with a material, preferably silver or silver-based, having sufficient hardness to be capable of penetrating the oxide film on the contact pads of semiconductor devices.

ISSUES

The issues on appeal are as follows:

1. Whether claims 13 to 16 are patentable over Galloway (EP 633507) under 35 U.S.C. 103(a).
2. Whether claims 17 to 20 are patentable over Galloway in view of Lytle (U.S. 5,674,780)

GROUPING OF CLAIMS

The claims do not stand or fall together for reasons set forth hereinbelow under ARGUMENT.

ARGUMENT

ISSUE 1

Claims 13 to 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Galloway (EP 633607). The rejection is without merit.

The invention relates to a known good die (KGD) carrier membrane for use in conjunction with a semiconductor carrier in the testing of semiconductor devices. In accordance with the present invention, there is provided a bumping technology that meets the pitch requirements of the evolving semiconductor products and which can be placed upon a low cost membrane with electrically conductive traces thereon that mirror the test carrier requirements. Galloway has absolutely nothing to do with KGD technology, carrier membranes for use in conjunction with a semiconductor carrier or the problems involved with this technology. For this reason alone, Galloway fails as a proper reference under 35 U.S.C. 103(a) since any teaching to apply the concepts of Galloway to the KGD art are derived solely from the subject application and not from Galloway.

In addition, claim 13 requires a membrane for use in conjunction with a semiconductor carrier. No such structure is taught or suggested by Galloway. It is noted that the bumps referred to are a part of a semiconductor device and not a membrane for use in conjunction with a semiconductor device as claimed.

Furthermore, claim 13 requires an electrically insulating substrate for application to a semiconductor carrier. No such feature is taught or suggested by Galloway either alone or in the combination as claimed.

Claim 13 yet further requires an interconnect pattern on the substrate. No substrate is taught or suggested by the applied reference in the combination as claimed.

Claim 13 still further requires a stud coupled to the interconnect pattern on the substrate, the stud comprising a gold ball and a compliant material coating over a portion of said gold ball. No such feature is taught or suggested by Galloway either alone or in the combination as claimed.

Claims 14 to 16 depend from claim 13 and therefore define patentably over the applied references for at least the reasons presented above with reference to claim 13.

In addition, claim 14 further limits claim 13 by requiring that the gold ball be the ball of a ball bond on the substrate. No such feature is taught or suggested by Galloway in the combination as claimed.

Claims 15 and 16 further limit claim 13 and 14 by requiring that the coating be a compliant epoxy resin. No such feature is taught or suggested by Galloway either alone or in the combination as claimed.

ISSUE 2

Claims 17 to 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Galloway in view of Lytle (U.S. 5,674,780). The rejection is without merit.

Claims 17 to 20 depend from claim 13 and therefore define patentably over the applied references for at least the reasons presented above with reference to claim 13 since Lytle fails to overcome the above-listed deficiencies of Galloway.

In addition, claims 17 and 18 further limit claims 15 and 16 by requiring that the compliant material be filled with a material having sufficient hardness to be capable of penetrating the oxide film on the contact pads of semiconductor devices. No such feature is taught or suggested by Galloway, Lytle or any proper combination of these references either alone or in the combination as claimed.

Claims 19 and 20 further limit claims 17 and 18 by requiring that the material be silver or silver-based flakes. No such feature is taught or suggested by Galloway, Lytle or any proper combination of these references either alone or in the combination as claimed.

CONCLUSIONS

For the reasons stated above, reversal of the final rejection and allowance of the claims on appeal is requested that justice be done in the premises.

Respectfully submitted,



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APPENDIX

The claims on appeal read as follows:

13. A membrane for use in conjunction with a semiconductor carrier which comprises:
- (a) an electrically insulating substrate for application to a semiconductor carrier;
 - (b) an interconnect pattern on said substrate; and
 - (c) a stud coupled to said interconnect pattern on said substrate, said stud comprising a gold ball and a compliant material coating over a portion of said gold ball.
14. The membrane of claim 13 wherein said gold ball is the ball of a ball bond on said substrate.
15. The membrane of claim 13 wherein said coating is a compliant epoxy resin.
16. The membrane of claim 14 wherein said coating is a compliant epoxy resin.
17. The membrane of claim 15 wherein said compliant material is filled with a material having sufficient hardness to be capable of penetrating the oxide film on the contact pads of semiconductor devices.
18. The membrane of claim 15 wherein said compliant material is filled with a material having sufficient hardness to be capable of penetrating the oxide film on the contact pads of semiconductor devices.

19. The membrane of claim 17 wherein said material is silver or silver-based flakes.

20. The membrane of claim 18 wherein said material is silver or silver-based flakes.